Texosporium sancti-jacobi (Tuck.) Nadv.

woven-spore lichen
Caliciaceae (Pin Lichen Family)

Status: USFWS Species of Concern
Rank: G2

General Description: This lichen forms a thin whitish to pale greyish crustose thallus on organic matter and organic soil. Patches of thalli with clusters of apothecia range in size from 0.5 to 3 cm in diameter. Apothecia are circular, from 0.5 to 1.5 mm in diameter, with a thalline margin (colored like the thallus). The centers of the apothecia are filled with a characteristic dark powdery spore mass ranging from blackish to olive green in color, and sometimes tinged with bright yellow. The spores are two-celled, which will be apparent only in the immature spores found at the base of the apothecium. As the spores mature, they become tightly wrapped with fungal hyphae that become progressively darker and thicker, thus obscuring the spore structure. Spore sizes including the fungal coat are about 36-44 x 20-26 microns, while the spores themselves are 19-26 x 10-14 microns.

thallus - the vegetative body of a lichen

apothecium - the sexual reproductive structure of the fungus, usually disk- or cup-shaped

hyphae - fungal filaments

soredia - asexual reproductive structures that are powdery to granular and not covered with a cortex; they contain both photobiont and mycobiont.

soralia - the areas of a lichen where soredia are produced

Identification Tips: Look for the distinctive whitish-margined apothecia with a dark olive powdery spore mass. The spores will dislodge from the apothecia when touched. A loose spore mass is also found in other Caliciales with sessile apothecia, such as *Cyphelium* and *Thelomma* species. However, these grow exclusively on sagebrush, old fenceposts, or other wood. In contrast, *T. sancti-jacobi* grows on the grounddead bunchgrass clumps that are impregnated with soil. It also is found on old, decaying small mammal scat.

T. sancti-jacobi may be confused with other whitish soil crusts that produce black to dark olive soredia arranged in roundish or irregular soralia (e.g., *Trapeliopsis* spp., other white soil crusts). However, these

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State Status Comments: A wildfire recently swept through the Washington population, leaving only a few patches of unburned *T. sancti-jacobi.* The status of this population is unknown at this time, but believed to be precarious.

Inventory Needs: Washington has not been adequately inventoried for this species. There is potential for its presence in most non-calcareous arid to semi-arid shrub-steppe and grassland communities in the state. Inventory efforts should begin with high-quality native communities in relatively flat topography.

Threats and Management Concerns: Fire, grazing, and recreational activities that reduce organic matter and disrupt soil surfaces will negatively impact this species. Invasive exotic annuals, such as *Bromus tectorum* and *Taeniatherum caput-medusae,* threaten existing populations by covering biotic soil crusts with light-limiting mats of litter. Invasion of these weeds following a fire will prevent the re-establishment of *T. sancti-jacobi* and may increase fire frequency. In addition, the species faces an ongoing threat of population and habitat losses due to suburban and agricultural development of shrub-steppe communities.

References:

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McCune, B. and R. Rosentreter. 1992. *Texosporium sancti-jacobi*, a rare Western North American lichen. Bryologist 95(3): 329-333.

Tibell, L. and A. van Hofsten. 1968. Spore evolution of the lichen *Texosporium sancti-jacobi* (=*Cyphelium sancti-jacobi*). Mycologia 60: 553-558.

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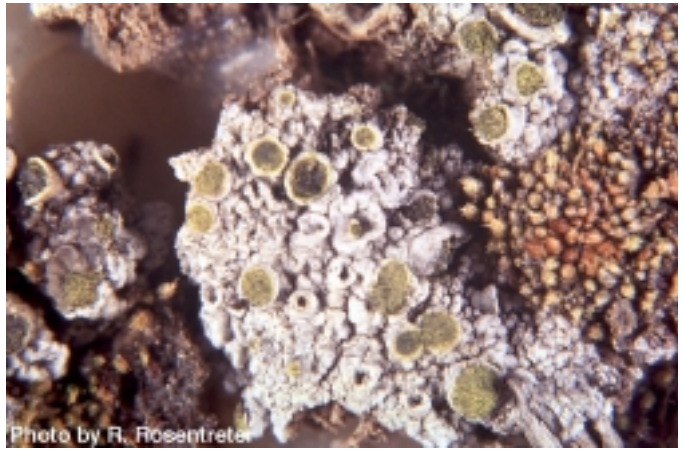
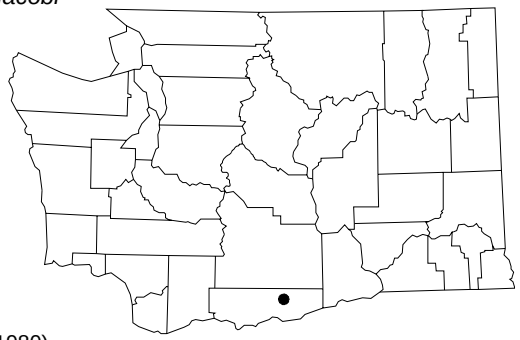


Known distribution of
Texosporium sancti-jacobi
in Washington



● Current (1980+)
○ Historic (older than 1980)

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Identification Tips(continued)**:** soralia generally do not have a thalline margin and are typically smaller than *T. sancti-jacobi* apothecia. Microscopically, soredia are easily distinguished from spores. The fungal hyphae covering the spores of *T. sancti-jacobi* is a diagnostic feature, being entirely unique among lichens.

Phenology: The apothecia are persistent throughout the year. However, the species is easiest to spot in the spring, when the ground is moist.

Range: There are a total of 15 known population centers in Washington, Idaho, California, and Oregon. In Washington, there is a single known site of *T. sancti-jacobi* in northeastern Klickitat County, representing the northern extent of the species. The largest concentration of populations is in a 23 by 25 mile area in southwestern Idaho.

Habitat: In the Pacific Northwest, *T. sancti-jacobi* is found in arid to semi-arid shrub-steppe, grassland or savannah communities up to 1000 m in elevation. Populations occur on relatively flat ground to slightly north-facing slopes. Soils are non-saline and non-calcareous, ranging from fine- to coarse-textured, and developed from non-calcareous parent materials. Most sites with *T. sancti-jacobi* are relatively undisturbed and dominated by native plants. The Oregon and Idaho sites all have some species of *Artemisia*. Other biotic soil crust organisms are usually abundant, including *Diploschistes muscorum*, *Cladonia* spp., *Psora* spp., *Bryum* spp., and *Ceratadon purpureus*.

In Washington, *T. sancti-jacobi* occurs in a *Purshia tridentata* / *Festuca idahoensis* community on mounds of soil in a biscuit-scabland. It grows on decomposing bunchgrass clumps that are elevated above the soil surface and abundantly covered with other lichens. Associated species include *Purshia tridentata, Poa secunda*, *Festuca idahoensis, Pseudoroegneria spicata*, the lichens *Megaspora verrucosa, Trapeliopsis* spp., *Cladonia* spp., and the moss *Encalypta rhaptocarpa*.

Ecology: *T. sancti-jacobi* is widely distributed in small, disjunct populations. Generally, it is found in communities that have not been disturbed for prolonged periods (> 20 years). Fire eliminates the species, and little is known of its ability to recolonize previously occupied sites. It is dependent on some form of organic matter for a substrate, commonly dead *Poa secunda* crowns and small mammal dung.

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